

Evaluation of Electrochemically Generated Potable Water Disinfectants for Use on the International Space Station

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Microbial contamination and subsequent growth in spacecraft water systems are constant concerns for missions involving human crews. The current potable water disinfectant is iodine; however, with the end of the Space Shuttle program, there is a need to develop redundant biocide systems which are less dependent on hardware that would need to be launched on a regular basis. Three systems for electrochemical production of potable water disinfectants are being assessed for use on the International Space Station (ISS). Since there is a wide variability in the literature with regards to efficacy in both concentration and exposure time of these disinfectants, there is a need to establish baseline efficacy values. This paper describes a series of tests performed in order to establish optimal concentrations and exposure times for four disinfectants against single and mixed species planktonic and biofilm bacteria and to determine whether these electrochemical disinfection devices are able to produce a sufficient amount of chemical in both concentration and volume to act as a biocide for potable water on ISS.